



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,836	07/24/2001	Andrew R. Reading	SEN01 P-338A	3877
28101	7590	08/02/2004	EXAMINER	
VAN DYKE, GARDNER, LINN AND BURKHART, LLP 2851 CHARLEVOIX DRIVE, S.E. P.O. BOX 888695 GRAND RAPIDS, MI 49588-8695				JACKSON, ANDRE K
ART UNIT		PAPER NUMBER		
				2856

DATE MAILED: 08/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/911,836	READING ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	André K. Jackson	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### **Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 07 May 2004.

2a)  This action is **FINAL**.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 19-43 and 59-81 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 19-43 and 59-81 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

13)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a)  The translation of the foreign language provisional application has been received.

14)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1)  Notice of References Cited (PTO-892) 4)  Interview Summary (PTO-413) Paper No(s) \_\_\_\_ .  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948) 5)  Notice of Informal Patent Application (PTO-152)  
3)  Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ . 6)  Other: \_\_\_\_ .

## DETAILED ACTION

1. In view of the Appeal Brief filed on 05/07/04, PROSECUTION IS HEREBY REOPENED. New grounds of rejection set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted.

See 37 CFR 1.193(b)(2).

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 19-25,29,36,39,42,43,59-64,67-79 and 81 are rejected under 35

U.S.C. 103(a) as being unpatentable over Breton in view of Sunshine et al.

Regarding claim 19, Breton discloses in "Real time on road vehicle exhaust gas modular flow meter and emissions reporting system" a gas analyzer system having at least two analyzer components, one of the analyzer components operating at a particular temperature and another of the analyzer components operating at an elevated temperature that is higher than the particular temperature the gas analyzer system adapted to measure at least one emission parameter from an internal combustion engine, the at least one emission parameter chosen from (i) concentration of at least one exhaust gas, (ii) mass of at least one exhaust gas, (ii) concentration of exhaust particulate matter; and (iv) mass of exhaust particulate matter and a housing for the gas analyzer system adapted to travel with a vehicle (Abstract, Page 7, Figures 1,2,3,4,7). Breton does not disclose where the housing defines at least two internal zones, the at least two internal zones commonly enclosed by the housing, one of the analyzer components being in one of the internal zones and the other of the analyzer components being in one of the internal zones where the at least two zones being at different operating temperatures. However, Sunshine et al. disclose in "Handheld sensing apparatus" where the housing defines at least two internal zones, the at least two internal zones

commonly enclosed by the housing, one of the analyzer components being in one of the internal zones and the other of the analyzer components being in one of the internal zones where the at least two zones being at different operating temperatures (Figures 7,8,9; Column 13). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the housing defines at least two internal zones, the at least two internal zones commonly enclosed by the housing, one of the analyzer components being in one of the internal zones and the other of the analyzer components being in one of the internal zones where the at least two zones being at different operating temperatures. By adding this feature the apparatus would be able to distinguish different gases at the same time.

Regarding claim 20, Breton discloses where the analyzer calculates the mass of the at least one exhaust gas in grams per each mile driven by the vehicle.

Regarding claim 21, Breton does not disclose where each of the internal zones has a substantially consistent temperature in a direction of the housing and where the zones vary in temperature from each other in another direction of the housing. However, Sunshine et al. disclose where each of the internal zones has a substantially consistent temperature in a direction of the housing and where the zones vary in temperature from

each other in another direction of the housing (Column 23). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where each of the internal zones has a substantially consistent temperature in a direction of the housing and where the zones vary in temperature from each other in another direction of the housing. By adding this feature the apparatus would be able to distinguish different gases at the same time.

Regarding claim 22, Breton discloses a volumetric flow meter adapted to be attached to an exhaust tailpipe of the vehicle and where the mass is determined by resolving the measured concentration and volumetric exhaust gas flow measured by the volumetric flow meter (Claims 5,6).

Regarding claim 23, Breton discloses a probe adapted to withdraw exhaust from a vehicle tailpipe.

Regarding claim 24, Breton discloses including a heated line connecting the probe with the housing (Figures 1,7).

Regarding claim 25, Breton discloses where the gas analyzer system operates substantially uninfluenced by supplemental cooling (Page 20).

Regarding claim 29, Breton does not disclose where one of the at least two analyzer components includes a heated device for measuring concentration of hydrocarbon, the heated device at a temperature

sufficiently high to reduce the deposit of hydrocarbon materials on the heated device. However, Sunshine et al. disclose where one of the at least two analyzer components includes a heated device for measuring concentration of hydrocarbon, the heated device at a temperature sufficiently high to reduce the deposit of hydrocarbon materials on the heated device (Figure 15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where one of the at least two analyzer components includes a heated device for measuring concentration of hydrocarbon, the heated device at a temperature sufficiently high to reduce the deposit of hydrocarbon materials on the heated device. By adding this feature the apparatus would be able to accurately detect the gas within the instrument.

Regarding claim 30, Breton discloses where the heated device includes an infrared-based gas concentration reader (30).

Regarding claim 36, Breton discloses where one of the at least two analyzer components includes at least one device for measuring NOx which operates substantially without supplemental cooling of the exhaust gas (Page 9).

Regarding claim 39, Breton discloses where the device for measuring NOx utilizes an electrochemical cell (Page 15).

Regarding claim 42, Breton discloses where one of the at least two analyzer components includes at least one gas detector to measure the concentration of at least one gas emitted from the engine, at least one pump to draw gas from the engine and at least one gas channel linking between the at least one detector and the at least one pump (Figure 4).

Regarding claim 43, Breton discloses where one of the at least two analyzer components is chosen from (i) a non-dispersive infrared analyzer, (ii) a Fourier transform infrared analyzer, (iii) an ultraviolet analyzer, (iv) a mass spectrometer, (v) a mass analyzer including an electromechanical oscillator holding a substrate onto which particulate matter can accumulate, and (vi) a mass analyzer comprising a filter substrate onto which particulate matter can accumulate (30, Figure 4).

Regarding claim 59, Breton does not disclose where the at least two internal zones are separated by at least one dividing wall. However, Sunshine et al. disclose where the at least two internal zones are separated by at least one dividing wall (Figures 7,8). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the at least two internal zones are separated by at least one dividing wall. By adding this feature the apparatus would be able to have the zones with different temperatures.

Regarding claim 60, Breton does not disclose where the at least two internal zones are opened to each other. However, Sunshine et al. disclose where the at least two internal zones are opened to each other (Figure 9). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the at least two internal zones are opened to each other. By adding this feature the apparatus would be able to distinguish different gases at the same time.

Regarding claim 61, Breton discloses where the housing is substantially moisture impervious in order to be resistant to environmental elements (Figure 7).

Regarding claim 62, Breton discloses where the housing is adapted to mounting at an external portion of a vehicle body (Figure 7).

Regarding claim 63, both Breton and Sunshine et al. disclose where the housing has a length and a width the length and width of the housing defining an aspect ratio, where the aspect ratio is greater than or equal to two (2) (Figures 7 and 2 respectively).

Regarding claim 64, Breton discloses a communication channel for communicating data from the at least one gas detector to a system outside of the housing (Figure 1).

Regarding claim 67, Breton discloses where the gas analyzer system includes one of a gasoline engine analyzer and a diesel engine analyzer (Page 8).

Regarding claim 68, Breton discloses where one of the at least two analyzer components is chosen from (i) a non-dispersive infrared analyzer, (ii) a Fourier transform infrared analyzer, (iii) an ultraviolet analyzer, (iv) a mass spectrometer, (v) a mass analyzer including an electromechanical oscillator holding a substrate onto which particulate matter can accumulate, and (vi) a mass analyzer comprising a filter substrate onto which particulate matter can accumulate (30, Figure 4).

Regarding claim 69, both Breton and Sunshine et al. disclose where the housing has a length and a width the length and width of the housing defining an aspect ratio, where the aspect ratio is greater than or equal to two (2) (Figures 7 and 2 respectively).

Regarding claim 70, Breton does not explicitly disclose where the housing is substantially in the form of a cylinder. However, Sunshine et al. disclose where the housing is substantially in the form of a cylinder (Figure 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the housing is substantially in the form of a cylinder. By adding this feature the apparatus would be able to be placed in the tailpipe of a vehicle.

Regarding claim 71, Breton does not explicitly disclose where the housing is substantially in the form a circular cylinder. However, Sunshine et al. disclose where the housing is substantially in the form a circular cylinder (Figure 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the housing is substantially in the form a circular cylinder. By adding this feature the apparatus would be able to be placed in the tailpipe of a vehicle.

Regarding claim 72, Breton discloses where at least one vehicle engine parameter is combined with an output of the gas analyzer system to determine a parameter of vehicle gas emission (Abstract).

Regarding claim 73, Breton discloses where at least one vehicle engine parameter is combined with the output of the gag analyzer system in a serial data stream (Page 16).

Regarding claim 74, Breton discloses a means for measuring flow rate of the emissions of the vehicle (Abstract).

Regarding claim 75, Breton discloses where the means for measuring flow rate includes a flow meter (Page 1).

Regarding claim 76, Breton does not disclose where the housing has an aerodynamic shape. However, Sunshine et al. discloses where the housing has an aerodynamic shape (Figure 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify Breton to include where the housing has an aerodynamic shape. By adding this feature the apparatus would be able to be placed in the tailpipe of a vehicle.

Regarding claim 77, Breton where the housing is substantially moisture impervious in order to be resistant to environmental elements (Figure 7).

Regarding claim 78, Breton discloses where one of the at least two analyzer components is chosen from (i) a non-dispersive infrared analyzer, (ii) a Fourier transform infrared analyzer, (iii) an ultraviolet analyzer, (iv) a mass spectrometer, (v) a mass analyzer including an electromechanical oscillator holding a substrate onto which particulate matter can accumulate, and (vi) a mass analyzer comprising a filter substrate onto which particulate matter can accumulate (30, Figure 4).

Regarding claim 79, Breton discloses a communication channel for communicating data from the at least one gas detector to a system outside of the housing (Figure 1).

Regarding claim 81, Breton discloses where the housing is adapted to mounting at an external portion of a vehicle body (Figure 7).

4. Claims 26,28 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breton in view of Sunshine et al. and in further view of Harvey et al.

Regarding claim 26, Breton does not explicitly disclose where the gas analyzer system operates at a temperature that is at or above the dew point of the vehicle exhaust gas. However, Harvey et al. disclose in "Methods and apparatus for providing diluent gas to exhaust emission analyzer" where the gas analyzer system operates at a temperature that is at or above the dew point of the vehicle exhaust gas (Abstract, Column 2, lines 54-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the gas analyzer system operates at a temperature that is at or above the dew point of the vehicle exhaust gas. By adding this feature the apparatus would eliminate condensation problems.

Regarding claim 28, Breton does not disclose where one of the at least two analyzer components includes a heated device for measuring concentration of hydrocarbon, the heated device at a temperature sufficiently high to reduce the deposit of hydrocarbon materials on the heated device. However, Sunshine et al. disclose where one of the at least two analyzer components includes a heated device for measuring concentration of hydrocarbon, the heated device at a temperature sufficiently high to reduce the deposit of hydrocarbon materials on the heated device (Figure 15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where one of the at least two analyzer components

includes a heated device for measuring concentration of hydrocarbon, the heated device at a temperature sufficiently high to reduce the deposit of hydrocarbon materials on the heated device. By adding this feature the apparatus would be able to accurately detect the gas within the instrument.

Regarding claim 66, Breton does not disclose vibration dampers to reduce vibration of components defining the gas analyzer system. However, Harvey et al. disclose dampers (26). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include vibration dampers to reduce vibration of components defining the gas analyzer system. By adding this feature the apparatus could accurately measure the gas within the system.

5. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Breton in view of Sunshine et al. and Harvey et al. as applied to claim 26 above, and further in view of Lessure et al.

Regarding claim 27, Breton does not disclose where the gas analyzer system further includes calculating means for compensating the emission parameter for the effect of humidity present in the exhaust gas. However, Lessure et al. disclose in "Non dispersive infrared gas analyzer with interfering gas correction" where the gas analyzer system further includes calculating means for compensating the emission parameter for the effect of humidity present in the exhaust gas (Column 4). Therefore, it

would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the gas analyzer system further includes calculating means for compensating the emission parameter for the effect of humidity present in the exhaust gas. By adding this feature the instrument would be able to properly detect gas component since water may have a spectrum, which overlaps the target gas.

6. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Breton in view of Sunshine et al. as applied to claim 29 and in further view of Xu et al.

Regarding claim 31, Breton does not disclose where the heated device includes a flame ionization device. However, Xu et al. disclose in "Method and apparatus for determining emission measurement accuracy" where the heated device includes a flame ionization device (Column 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the heated device includes a flame ionization device. By adding this feature the apparatus would be able to measure the total hydrocarbon concentration.

7. Claims 32,33 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breton in view of Sunshine et al. and in further view of Balko.

Regarding claim 32, Breton does not disclose where the device for measuring concentration of hydrocarbon is heated to a temperature at or above 60 degrees centigrade. However, Balko discloses in "Multi-channel pellistor type emission sensor" where the device for measuring concentration of hydrocarbon is heated to a temperature at or above 60 degrees centigrade (Column 9). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the device for measuring concentration of hydrocarbon is heated to a temperature at or above 60 degrees centigrade. By adding this feature the apparatus would be able to accurately detect the gas within the instrument.

Regarding claim 33, Breton discloses where the gas analyzer is adapted to spark ignition engines (Pages 14,16).

Regarding claim 38, Breton does not disclose where the device for measuring NOx utilizes a heated zirconia detector. However, Balko disclose where the device for measuring NOx utilizes a zirconia detector (Column 7). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the device for measuring NOx utilizes a heated zirconia detector. By adding this feature the apparatus could precisely measure the gas component.

8. Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breton in view of Sunshine et al. and Xu et al. as applied to claim 29 and in further view of Balko.

Regarding claim 34, Breton does not disclose where the device for measuring concentration of hydrocarbon is heated to a temperature at or above 175 degrees centigrade. However, Balko discloses where the device for measuring concentration of hydrocarbon is heated to a temperature at or above 175 degrees centigrade (Column 9). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the device for measuring concentration of hydrocarbon is heated to a temperature at or above 175 degrees centigrade. By adding this feature the apparatus would be able to accurately detect the gas within the instrument.

Regarding claim 35, Breton discloses where the gas analyzer is adapted to compression-ignition engines (Abstract).

9. Claims 37,40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breton in view of Sunshine et al. and in further view of Akiyama et al.

Regarding claim 37, Breton does not disclose where the device for measuring NOx utilizes ultraviolet detection techniques. However, Akiyama et al. disclose in "Gas analyzer" where the device for measuring NOx utilizes ultraviolet detection techniques (Abstract). Therefore, it

would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the device for measuring NOx utilizes ultraviolet detection techniques. By adding this feature the apparatus would be able to accurately detect the gas within the instrument.

Regarding claim 40, Breton does not disclose where one of the at least two analyzer components includes at least one device for measuring NOx which utilizes ultraviolet detection techniques. However, Akiyama et al. disclose where the analyzer components include at least one device for measuring NOx, which utilizes ultraviolet detection techniques (Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where one of the at least two analyzer components includes at least one device for measuring NOx which utilizes ultraviolet detection techniques. By adding this feature the apparatus would be able to accurately detect the gas within the instrument.

Regarding claim 41, Breton does not disclose where the gas analyzer includes an ultraviolet discharge lamp. However, Akiyama et al. disclose where the gas analyzer includes an ultraviolet discharge lamp (Figure 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include

where the gas analyzer includes an ultraviolet discharge lamp. By adding this feature the apparatus would be able to accurately detect the gas.

10. Claims 65 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breton in view of Sunshine et al. and in further view of Stedman et al.

Regarding claim 65, Breton does not disclose where the communication channel is a wireless communication channel. However, Stedman et al. disclose in "System and method for remote analysis of small engine vehicle emissions" where the communication channel is a wireless communication channel (Column 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the communication channel is a wireless communication channel. By adding this feature the apparatus would be able monitor multiple vehicles.

Regarding claim 80, Breton does not disclose where the communication channel is a wireless communication channel. However, Stedman et al. disclose in "System and method for remote analysis of small engine vehicle emissions" where the communication channel is a wireless communication channel (Column 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Breton to include where the communication channel

is a wireless communication channel. By adding this feature the apparatus would be able monitor multiple vehicles.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to André K. Jackson whose telephone number is (571) 272-2196. The examiner can normally be reached on Mon.-Thurs. 7AM-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A.J.

July 23, 2004

  
HEZRON WILLIAMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800